APPENDIX B

STATEMENT OF WORK

ARKEMA REMOVAL ACTION
PORTLAND HARBOR SUPERFUND SITE
PORTLAND, OREGON

I. PURPOSE

The primary purposes of this Statement of Work (SOW) are: (1) to implement the Administrative Order on Consent for Removal Action (AOC); (2) facilitate and expedite the feasibility study and implementation of controls on upland sources to the Willamette River; and (3) expedite the characterization, feasibility study, cleanup alternatives analysis, and performance of cleanup on the principal threat in the intertidal area and submerged lands on and adjacent to the Arkema Site.

The removal action will identify the areal extent of the project, which will become the Arkema Removal Action Area (RAA). Beyond the RAA, the removal action will not address all contamination and releases of hazardous substances from the Arkema Site that may be posing unacceptable risks to human health and the environment. The river-wide Portland Harbor Superfund Site cleanup will address releases of hazardous substances from the Arkema Site beyond the RAA.

Removal Action Objectives shall include, at a minimum:

1. Reduce human health risks to acceptable levels from direct contact with and incidental ingestion of chemicals of concern (COCs) in sediments and riverbank within the RAA.
2. Reduce COC concentrations in sediments and riverbank within the RAA to levels that will result in acceptable risks to humans that eat fish and shellfish from the Willamette River.
3. Reduce human health risks to acceptable levels from direct contact with and incidental ingestion of water with COCs within the RAA.
4. Reduce ecological risks from contact with and ingestion of COCs in sediments or riverbank material or prey within the RAA to acceptable levels.
5. Reduce ecological risks to acceptable levels from contact with and ingestion of water with COCs within the RAA.
6. Eliminate the potential for migration of contaminants at unacceptable levels from the RAA to the Willamette River.
7. Reduce contaminant flux from uplands, riverbank, and sediments so that recontamination of any sediment or riverbank caps put in place does not occur.

The Work to be completed under this SOW shall include preparation, delivery, and implementation of the following:

1. Engineering Evaluation/Cost Analysis (EE/CA) Work Plan (draft and final);

2. Removal Action Area Characterization Report(s) (draft and final);
3. Engineering Evaluation/Cost Analysis (EE/CA) Report (draft and final);
4. Biological Assessment (BA) and Clean Water Act (CWA) (Section 404) Analysis Memorandum;
5. Removal Action Design Documents (conceptual, pre-final and final);
6. Removal Action Work Plan (draft and final);
7. Implementation of Removal Action;
8. Removal Action Completion Report (draft and final);
9. Long-Term Monitoring and Reporting Plan (if appropriate); and
10. Community Involvement Activities

Removal activities shall be completed in accordance with Table 1 of this SOW.

The Respondent will coordinate meetings and/or teleconferences with EPA, DEQ, the Tribes, and the Natural Resource Trustees to discuss the status of work described in this SOW. After approval of the EE/CA Work Plan, such meetings shall be monthly, if needed. DEQ, the Tribes and the Trustees will submit their comments to EPA. EPA will provide the comments to Respondent that Respondent is to address. Respondent will coordinate quarterly meetings with EPA and DEQ and/or written updates will be provided in place of a meeting regarding upland source control actions on the Arkema Site.

II. WORK TO BE PERFORMED BY RESPONDENT

Deliverables specified in this SOW shall be consistent with "EPA's Guidance on Conducting Non-Time-Critical Removal Actions under CERCLA" (EPA/540/R-93/057, OSWER 9360.0-32). Work to be completed under this SOW shall also include activities necessary to achieve the objectives, criteria and performance standards contained in this SOW, or any work plan, report, or other deliverable approved under the AOC and this SOW. Work to be completed under this SOW shall, to the extent practicable, be consistent with the Portland Harbor Superfund Site RI/FS, and contribute to the efficient performance of the long-term remedial action.

Respondent shall complete the following tasks:

1. Engineering Evaluation/Cost Analysis (EE/CA) Work Plan

Respondent shall submit an EE/CA Work Plan that will include a summary of existing information, a project work plan, a Sampling and Analysis Plan (SAP) and a Health and Safety Plan (HASP).

The EE/CA Work Plan shall include, at a minimum, the following information:

- Introduction/Purpose;

- Brief description of the Arkema Removal Action Area characteristics, including ecological and physical characteristics;

- Identification of historic and ongoing sources of contamination to the Arkema Removal Action Area, including past and present operations, drainage, discharges, groundwater seeps, or other releases;

- Summary of existing information on upstream and upland contamination sources that have the potential to contaminate the Removal Action Area, including a description of environmental investigations, environmental cleanups and planned upland source control measures that are being conducted under agreements with DEQ as the lead agency. The summary of upland source control measures being conducted must contain a schedule for implementation to be completed prior to the EE/CA**;**

- Arkema historical information including dredging history and identification of past and present property owners, operators, and major tenants as well as owners and operators of all immediately adjacent upland properties;

- Summary of current facility operations and potential access or operational constraints on Work Plan implementation;

- Description of the nature and extent of contamination in the Arkema Removal Action Area, to the extent known, including a summary of existing sediment quality data with a comparison to:

    1) Existing ecological sediment quality guidelines that represent a range of levels including, but not limited to, low or no effects (e.g., Threshold Effects Concentrations [TECs], Threshold Effects Levels [TELs], Effects Range Low [ERLs]), as well as levels at which some effects are expected (e.g., Probable Effects Concentrations [PECs], Effects Range Medium [ERMs]). Existing chemistry data will be reviewed to establish Category 1 and Category 2 data categories in accordance with the Portland Harbor RI/FS protocols;
    2) Estimated risk-based sediment cleanup values for persistent bioaccumlative toxins (PBTs) that protective of humans and wildlife that consume aquatic biota from the Willamette River; and
    3) Sediment cleanup values that are protective of humans from direct contact with, and incidental ingestion of, chemicals of concern in sediments, riverbank and water. Existing sediment data should be plotted on site maps. Locations with sediment concentrations above the risk based levels in (1), (2), and (3) above should be indicated on these maps.

- Summary of results from sediment toxicity testing conducted to date;

- A process for developing a cultural resources survey, and a process for developing procedures to protect and address such cultural resources;

- Identification of Removal Action Objectives (RAOs), potential Applicable or Relevant and Appropriate Requirements (ARARs), and To Be Considered (TBCs) for the Arkema Removal Action Area;

- A description of the analysis to be conducted to determine disposal facility or containment options for contaminated sediment;

- A detailed conceptual site model that shows the relationship of the contaminant plumes including, but not limited to: pH variations, hexavalent chrome, perchlorate, monochlorobenzene, DDT, and salinity gradients, starting in the uplands and continuing through the riverbank, and into sediment in the river, to the full extent of the data available at the time of submittal; and

- Other information (including maps and figures) necessary to gain a general understanding of the Arkema Removal Action Area.

Respondent shall also identify data gaps that will be filled by the collection and analysis of field data. Investigation activities will focus on problem definition and will result in data of adequate quality and technical content to evaluate the following:

- Nature, extent, and volume of riverbank and sediment contamination including the degree to which riverbank and sediments will need to be removed that represent the principal threat of contamination, an ongoing source of contaminants to the river, and which may represent a recontamination risk to any cap put in place;

- Potential human health and ecological risks resulting from sediment and surface water contamination;

- Engineering characteristics of the Removal Action Area including sediment consistency, dredgeability, potential slope stability issues related to dredging, and potential sediment consolidation issues associated with capping;

- Potential water quality effects associated with dredging, piling removal, sheet pile installation, capping, or disposal technologies;

- Technologies for sediment remediation including capping, dredging, treatment, including any necessary treatability testing, and disposal (on-site and off-site);

- If necessary, assessment of hydraulic control measures, including a sheet pile wall keyed into bedrock across the site, should they be necessary to reduce the recontamination risk to the in-water work (riverbank and sediment cleanup); and

- Potential impacts to threatened or endangered species, other biological receptors, and the potential habitat benefits and impacts of the removal action.

The procedures Respondent plans to implement when conducting all field activities will be detailed in the SAP for the specific field activity. The initial SAP will be included in the EE/CA Work Plan. The SAP for any field activity will ensure that sample collection and analytical activities are conducted in accordance with technically acceptable protocols and that data meet data quality objectives. A SAP provides a mechanism for planning field activities and consists of a Field Sampling Plan (FSP) and a Quality Assurance Project Plan (QAPP). Details are provided in Section III of this SOW.

Respondent shall also prepare HASP that is designed to protect personnel from physical, chemical and other hazards posed by field sampling efforts. Details are set forth in Section III of this SOW.

Upon request by EPA, Respondent shall also submit copies of previous studies or sampling efforts conducted independently or under local, state or other federal authorities or agreements that are determined by EPA to relate to remedy selection under this Order.

Additionally, Respondent shall continue to work under DEQ supervision on upland source control actions related to the Arkema Site and that are threatening to be released to the Willamette River, which may include source identification, source prioritization, documentation and tracking of source control plans and completed source control actions, evaluating and documenting effectiveness of source control measures, and providing input to EPA's and DEQ's decision as to effectiveness of source control in order to implement the Removal Action. The goal is for significant upland sources to be controlled to the greatest extent practicable before or during Removal Action implementation such that significant post Removal Action recontamination is not predicted. The EE/CA work plan shall contain a process and schedule for evaluation of the upland source control program. As a result of the evaluation, should it be determined that sources are not being controlled sufficiently to achieve the RAOs, this SOW requires, upon notice by EPA, Arkema to conduct evaluation of hydraulic control measures in the EE/CA, including, but not limited to, installation of a sheet pile wall, such that this Removal Action may occur without the expectation of recontamination. A schedule for such evaluation will be included in the EE/CA work plan.

2. Removal Action Area Characterization Report

Respondent shall submit a Removal Action Area Characterization Report that includes information from field sampling events, including validated analytical results.

The Removal Action Area Characterization Report shall include, at a minimum, the following sections:

- Introduction/Purpose;

- Summary of the field sampling effort that, at a minimum, includes sampling vessel information, field effort dates, a summary of the sample collection effort (e.g., surface sediment, subsurface sediment, and surface water samples), field sample observations

(e.g., sediment descriptions), and a summary of sample and station locations – including station depths (corrected to mean lower low water), station locations (latitudes/longitudes and state plane coordinates), maps and figures;

- Deviations from the FSP;

- Summary of sample handling and shipment; and

- Summary of all data, including a data validation report. Data from this effort shall be provided electronically in a format consistent with other data already acquired under the harbor-wide study.

- Description of the nature and extent of contamination in the Arkema Removal Action Area including a summary of existing and newly collected surface and subsurface sediment quality data with a comparison to:

    a. Existing ecological sediment quality guidelines that represent a range of levels including, but not limited to, low or no effects (e.g., Threshold Effects Concentrations [TECs], Threshold Effects Levels [TELs], Effects Range Low [ERLs]), as well as levels at which some effects are expected (e.g., Probable Effects Concentrations [PECs], Effects Range Medium [ERMs]). Existing chemistry data will be reviewed to establish Category 1 and Category 2 data categories in accordance with the Portland Harbor RI/FS protocols;
    b. Estimated risk-based sediment cleanup values for persistent bioaccumlative toxins (PBTs) that protective of humans and wildlife that consume aquatic biota from the Willamette and
    c. Sediment cleanup values that are protective of humans from direct contact with, and incidental ingestion of, chemicals of concern in sediments, riverbank and water.

Existing sediment data should be plotted on site maps. Locations with sediment concentrations above the risk based levels in (1), (2), and (3) above should be indicated on these maps.

Respondent shall submit the data validation report to EPA within 5 days of Respondent's receipt of the data validation report from their contractor or in-house source. Information necessary for EPA to perform an independent review of the validated data shall also be provided.

3. Engineering Evaluation/Cost Analysis (EE/CA) Report

Based on data obtained in the previous sampling efforts and work to be performed under this SOW, and in consideration of EPA's guidance for this removal actions[1], Respondent

[1] Including, but not limited to: "Institutional Controls: A Site Manager's Guide to Identifying, Evaluating and Selecting Institutional Controls at Superfund and RCRA Corrective Action Cleanups," (EPA 540-F-00-

will prepare a technical briefing for EPA, DEQ, the Tribes and the Trustees on the proposed removal alternatives that will be presented by Respondent in the EE/CA.

After the technical briefing, Respondent, in consideration of comments received at the technical briefing, will submit a first draft of the EE/CA.

The first draft EE/CA will be revised in response to EPA comments. A second draft EE/CA shall be submitted to EPA for review and comment, or modification if requested by EPA. If requested by EPA, a final version of the EE/CA shall be submitted to EPA for review and preliminary approval in accordance with the schedule set forth in Table 1 of this SOW. Upon preliminary approval of the EE/CA by EPA, the EE/CA will be released for a formal public comment period. The EE/CA will contain the following sections:

- Executive Summary;
- Introduction;
- Removal Action Area Characterization;
- The result of the analysis regarding the post Removal Action recontamination potential of the Arkema Removal Action Area by (1) in water contaminated sediments outside of the RAA and (2) upland sources of contamination, including whether source control actions will be sufficient or if additional actions may be required to control potential sources of significant recontamination;
- Procedures for addressing and protecting cultural resources in the Removal Action Area;
- Identification of Removal Action Objectives;
- Identification and Analysis of Removal Action Technologies;
- Identification and Analysis of Removal Action Alternatives, including the identification and analysis of disposal facility or containment options and incorporating the costs of any Removal Action and the alternative analysis for any proposed institutional controls, if applicable;
- Comparative Analysis of Removal Action Alternatives, including upland hydraulic control alternatives, if necessary;
- Recommended Removal Action Alternative, including the selection of any needed disposal facility;
- An assessment of the residual risk anticipated after Removal Action implementation;
- Schedule for recommended Removal Action; and
- Preliminary drafts of the Biological Assessment and Clean Water Act analysis memorandum for the recommended Removal Action alternative (see Section 4 below).

A public comment period of at least thirty (30) days is required for the EE/CA and any supporting documentation. Respondent shall assist EPA, as requested, before and during the comment period with its community relations activities concerning the EE/CA.

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005), OSWER Dir. 9355.0-74FS-P, Sept. 2000; all guidances referenced in the AOC; or CERCLA guidances otherwise appropriate for the removal action alternatives being considered.

Respondent shall also assist EPA in compiling the Administrative Record before and during the public comment period. If, based on public comments received, EPA determines additional data or analyses are required to complete the EE/CA, Respondent shall collect such data, or perform such analyses, as determined necessary by EPA.

4. Biological Assessment (BA) and Clean Water Act (CWA) (Section 404) Analysis Memorandum

In order to identify the presence of threatened, endangered, proposed or candidate species, or their habitat, within the vicinity of the proposed Arkema Removal Action Area, Respondent will prepare, for EPA approval, a draft BA to support compliance with the substantive requirements of the Endangered Species Act. The draft BA will characterize baseline conditions of existing habitat; address potential project impacts that the Removal Action may have on these species, their habitat, and their food stocks; and describe best management practices and conservation measures designed to avoid or minimize any negative impacts.

If dredging, capping, or other filling is a component of any of the alternatives, Respondent shall submit a draft memorandum that provides sufficient information to demonstrate compliance with the substantive requirements of Section 404(b) (1) of the CWA. The memorandum shall document the information gathered regarding practicability and cost, long- and short-term impacts from all proposed alternatives, minimization of adverse effects, and an analysis of the need for any mitigation.

5. Project Design Documents

After EPA has selected a removal action for the Removal Action Area and set forth its determination and selected action in an Arkema Removal Action Memorandum, Respondent shall prepare project design documents, including construction plans and specifications, to implement the Removal Action and shall demonstrate that the Removal Action design shall meet all objectives of any Action Memorandum or other EPA decision document. Respondent shall meet regularly with EPA prior to and during development of design documents and provide EPA, for review and approval, the key technical documents that support the removal design (see below). Design documents, including plans and specifications, shall be submitted in accordance with the schedule set forth in Table 1 of this SOW.

5.1 Conceptual, Prefinal, and Final Designs

Respondent shall submit the following levels of design:

- Conceptual design when the design effort is 30 percent complete;
- Prefinal design when the design effort is 90 percent complete;
- Final design when the design effort is 100 percent complete.

The final design shall fully address all EPA comments made on the prefinal design.

5.1.1 Conceptual (30 percent) Design shall include an overall explanation of the following as appropriate:

- If the selected alternative includes capping, the conceptual design will show capping areas and conceptual slope and cap designs;
- If the selected alternative includes dredging, the conceptual design will show dredging areas and conceptual cut thicknesses and slope angles;
- Proposed disposal technology (on-site or off-site) conceptual design including general disposal location, handling methods and transport approaches;
- Annotated outline of prefinal design analysis report;
- Annotated outline of plan drawings;
- Annotated outline of specifications.

5*.1.2 Prefinal (90 percent) Design* shall include three separate deliverables as follows:

- Prefinal (90 percent) Design Analysis Report;
- Prefinal (90 percent) Construction Documents and Schedule;
- Prefinal (90 percent) Design Plans.

5.1.2.1 Prefinal (90 percent) Design Analysis Report shall provide the design criteria and the basis of design for the Removal Action. Examples of the types of information to be included are described below:

- Technical parameters and supporting calculations upon which the design will be based, including but not limited to design requirements for each remedial action technology to be employed (e.g., dredging, capping);

- If the selected alternative includes capping:

    - appropriate physical and chemical characteristics of materials to be used for sediment capping and method for identifying and testing clean source material, including acceptance criteria for such material;

    - determinations regarding potential propeller scour for capped areas;

    - cap placement techniques;

- If the selected alternative includes dredging and/or excavation:

    - Identification of requirements for the contractor regarding the handling, transport (including haul routes) and disposal of dredged or excavated sediments , including identification of any best management practices, monitoring, and/or analyses necessary to protect personnel from potential chemical hazards posed by this Removal Action (such activities may be further described in the contractor's HASP);

- design dredge or excavation depths and overcut allowances, dredged or excavated material volumes, and dredging or excavation techniques;

- identification of potential location(s) for disposal of dredged or excavated sediments;

- if the proposed disposal technology is an off-site upland landfill, the design documents will include descriptions of sediment transloading (from water transport to land transport), stockpiling, dewatering, and overland transport;

- if the proposed disposal technology is an on-site near shore Confined Disposal Facility (CDF), the design documents will include fill closure approach, hydrogeologic and contaminant transport evaluation for the fill, static and seismic stability analyses, filling approach, consolidation analysis, and screening of other potential sources of material for the CDF;

- Descriptions of the analyses conducted to select the design approach, including a summary and detailed justification of design assumptions and verification that design will meet performance standards;

- Access and easement requirements, and permit requirements or substantive requirements of permits;

- Plan for reducing negative effects on the environment and community during the construction phase(s);

- An outline of the long-term monitoring and reporting plan; and

- Analysis and recommendations on institutional controls and/or engineering controls that may need to be implemented to ensure the long-term effectiveness of the Removal Action, including descriptions of how such controls would be implemented, by whom, and under what circumstances such controls could be removed or terminated (see "Institutional Controls" OSWER 9355.0-74FS-P, EPA 540-F-00-005, September 2000).

- If appropriate, conduct an update of the analysis regarding post Removal Action recontamination of the Arkema Removal Action Area by upland sources of contamination, including what source control actions have occurred since the EE/CA analysis and whether additional actions may be necessary to control potential sources of significant recontamination.

If the selected alternative includes capping, the cap design shall follow appropriate EPA guidance, including "Guidance for In-Situ Subaqueous Capping of Contaminated Sediments" (EPA 905-B96-004). Performance of capping activities shall be consistent

with federal regulations, including the requirements of Sections 401 and 404 of the CWA and Section 10 of the Rivers and Harbors Act.

If the selected alternative includes dredging, the performance standards shall be consistent with federal regulations, including requirements of Sections 404 and 401 of the CWA and Section 10 of the Rivers and Harbors Act.

5.1.2.2 Prefinal (90 percent) Construction Documents and Schedule, including:

- Construction plans/drawings/sketches and required specifications;

- Proposed locations of processes/construction activity or specific requirements for such locations;

- Schedule for construction and implementation of the Removal Action that identifies major milestones.

5.1.2.3 Prefinal (90 percent) Design Plans, including:

- Draft Construction Quality Assurance Plan (see Section III of this SOW) which shall detail the remediation verification method and approach to quality assurance during construction activities in the project area, including compliance with ARARs. The Plan will describe the methods used to measure compliance with measurement quality objectives (such as performance and method requirements), including target dredge or excavation depths, if appropriate. The Plan will include, as an attachment, a Draft Removal Action Sampling and Analysis Plan (see Section III of this SOW), which shall include a field sampling plan and a QAPP. If the selected alternative includes capping, performance monitoring will include characterization of in-place capping materials (e.g., coverage and thickness). If the selected alternative includes dredging or excavation, performance monitoring will be performed to confirm that dredged or excavated material is properly staged, dewatered, and transported to a suitable disposal site; and that field construction activities are properly sequenced.

- Draft Water Quality Monitoring Plan and its associated Quality Assurance Project Plan and HASP (see Section III of this SOW), which shall detail water quality monitoring to confirm that water quality standards as defined by substantive requirements of CWA Section 401 water quality certification for compliance with the requirements in CWA Section 404(b)(1) guidelines are met (or ensure approval to allow temporary exceedances of water quality standards has been received) during any capping and dredging operations and where return-water from barges or de-watering (as appropriate) may affect the water column. The plan shall describe the specific water quality monitoring requirements, including a schedule; sampling locations; sampling intervals; sampling equipment and parameters; analytical methods; key contacts; reporting requirements (including daily reports); daily contacts for notifications of any exceedances; result summaries; and draft and final

Water Quality Monitoring reports. A QAPP and a HASP specific to water quality monitoring shall be included in this deliverable.

5.1.3 Final (100 percent) Design:

The 100 percent Final Design submittal shall include the following:

- Final Design Analysis Report;
- Final construction documents and schedule;
- Final Design Plans;
- Operation, Maintenance, and Monitoring Plan;
- Final cost estimate for the Removal Action and estimated cost for long-term monitoring; and
- Final schedule.

6. Removal Action Work Plan

Respondent shall prepare a Removal Action Work Plan that outlines the implementation of the selected Removal Action alternative, including how construction activities are to be implemented by Respondent and coordinated with EPA. The Work Plan shall include, at a minimum, the following elements that are consistent with and implements the approved final design:

- Removal action project plan describing the sequence of activities;

- A description of how the removal action implements the final design;

- Schedule of activities for completion of the Removal Action, including inspections, meetings, and documents referenced in this task;

- Remedial action HASP that is designed to protect personnel from physical, chemical and other potential hazards posed by this Removal Action;

- Construction quality assurance plan (CQAP) and statement of qualifications (for the construction contractor). The CQAP will describe in detail the methods for direct measurements to be made during construction to ensure RAOs and performance standards will be met;

- Remedial action environmental protection plan;

- Procedures for processing design changes and securing EPA review and approval of such changes to ensure changes are consistent with the objectives of this Removal Action;

- Procedures for coordinating with EPA regarding compliance with EPA's Off-Site Rule, as applicable.

The HASP shall follow EPA guidance and all OSHA requirements as outlined in 29 C.F.R. 1910 and 1926. Respondent may utilize existing HASP project documents or other company/contractor HASPs provided that Respondent demonstrates the HASP has been modified, as necessary, or otherwise sufficiently addresses the activities covered by this SOW. Draft and Final versions of the Removal Action Work Plan shall be submitted to EPA for review and approval in accordance with the schedule set forth in Table 1 of this SOW.

7. Implementation of Removal Action

As described in Table 1, Respondent shall provide notification to EPA thirty (30) days prior to initiation of fieldwork to allow EPA to coordinate field oversight activities.

Respondent shall complete the sediment Removal Action in accordance with the approved Final Design documents and Removal Action Work Plan. The following activities shall be completed in constructing the Removal Action.

EPA and Respondent shall participate in a preconstruction meeting to:

- Review methods for documenting and reporting data, and compliance with specifications and plans including methods for processing design changes and securing EPA review and approval of such changes as necessary;

- Review methods for distributing and storing documents and reports;

- Review work area security and safety protocols, as appropriate;

- Demonstrate that construction management is in place, and discuss any appropriate modifications of the CQAP to ensure that project specific considerations are addressed;

- Discuss methods for direct measurement, including confirmation sampling of construction work to be used to ensure performance standards are met;

- If requested, conduct a Removal Action Area tour in the project area to verify that the design criteria, plans, and specifications are understood and to review material and equipment storage locations, as appropriate.

- If appropriate, conduct an update of the analysis regarding post Removal Action recontamination of the Arkema Removal Action Area by upland or upstream sources of contamination, including what source control actions have occurred since the EE/CA analysis, whether additional actions and/or schedule delays may be necessary to control potential sources of significant recontamination.

Respondent shall transmit (electronically) draft key points and action items of the preconstruction meeting to all parties identified in Section XXX of the AOC within seven (7) days of the meeting. Respondent shall submit final key points and action items of the preconstruction meeting to all parties identified in Section XXX of the AOC within fourteen (14) days of the meeting.

Pursuant to the CQAP, monthly reports shall be prepared and submitted (electronically) to EPA for review during the Removal Action. Monthly reports shall include work performed, problems encountered and solutions proposed, water quality monitoring results, and work to be performed during the following week. If applicable, Respondent shall inform EPA of the off-site disposal facility proposed to receive any debris or dredged/excavated materials from the Arkema Removal Action Area.

Within seven (7) days after Respondent makes a preliminary determination that construction is complete, Respondent shall orally notify EPA for the purposes of scheduling a final inspection and/or meeting. Within fourteen (14) days after the final inspection and/or meeting, Respondent shall send a letter to EPA stating that construction is complete and responding to any outstanding issues that were raised by EPA during the final inspection/meeting.

8. Removal Action Completion Report

Within 90 days after completion of the construction phase of the Removal Action, Respondent shall submit for EPA review and approval a Removal Action Completion Report. This report shall contain a description of the Work described in the Removal Action Work Plan and the Work that was actually performed. In the report, a registered professional engineer and Respondent shall state that the Removal Action has been constructed in accordance with the design and specifications. The report shall provide as-built drawings, signed and stamped by a professional engineer, showing the area and depth of the location remediated. The final report shall include a listing of quantities and types of materials removed off-site or handled on-site, a listing of the ultimate destination(s) of those materials, a presentation of the analytical results of all sampling and analyses performed (including a map showing the locations of any confirmatory samples), and accompanying appendices containing all relevant documentation generated during the Removal Action (e.g., manifests and permits). All analytical data collected under this AOC shall be provided electronically to EPA. The final Water Quality Monitoring report may be submitted as an appendix to the Removal Action Completion Report. This Removal Action Completion Report shall contain a description of any institutional controls that are in place, or engineering controls that are necessary to sustain the integrity of the Removal Action, along with copies of any agreements or other documents used to establish and implement such controls.

The final report shall also include the following certification signed by a person who supervised or directed the preparation of that report:

"Under penalty of perjury under the laws of the United States, I certify that to the best of my knowledge, after appropriate inquiries of all relevant persons involved in the preparation of the report, the information submitted is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment."

9. Long-Term Monitoring and Reporting Plan

If identified as a component of the selected alternative, Respondent shall prepare a Long-Term Monitoring and Reporting Plan for the Arkema Removal Action Area. The Long-Term Monitoring and Reporting Plan shall include inspections and analyses to monitor the Removal Action implemented at the Arkema Removal Action Area, including the institutional controls contained in the Action Memorandum.

If required, the Long-Term Monitoring and Reporting Plan shall describe monitoring objectives, an overview of the monitoring approach, design of the monitoring program (e.g., sampling strategy, station locations and replication, field sampling methods, laboratory methods), data analysis and interpretation, reporting requirements, and a schedule. The Plan shall include, as appropriate, visual inspection, bathymetric survey, sediment deposition monitoring, chemical monitoring, and sediment samples in capped areas and non-capped areas (including excavated areas) to monitor for recontamination. Data from long-term monitoring shall be assembled into reports and submitted to EPA in accordance with the schedule set forth in the Long-Term Monitoring and Reporting Plan. Based on long-term monitoring results, EPA shall determine if future response actions are needed to achieve the cleanup objectives.

10. Community Involvement Activities

If requested by EPA, Respondent shall provide information supporting EPA's community involvement programs related to the Work performed pursuant to this Order, and shall participate in public meetings which may be held or sponsored by EPA to explain activities at the Removal Action Area or concerning Work performed pursuant to this Order. EPA will coordinate its community outreach efforts with DEQ.

III. CONTENT OF SUPPORTING PLANS

1. Sampling and Analysis Plan

Respondent shall develop a project-specific SAP, or if multiple rounds of sampling are to occur, a field sampling round-specific SAP, comprising an FSP and a project-specific or field sampling round-specific QAPP for sample analysis and data handling for samples collected at the Removal Action Area. The SAP shall be based upon the AOC, SOW and EPA guidance.

The FSP will define in detail the sampling and data-gathering methods that will be used on the project. It will include sampling objectives, a detailed description of sampling activities, sample locations, sample analysis, sampling equipment and procedures, sampling schedule, station positioning, and sample handling (e.g., sample containers and labels, sample preservation). The SAP will be prepared in accordance with "Methods for Collection, Storage and Manipulation of Sediments for Chemical and Toxicological Analyses: Technical Manual" (EPA/823/B-01-002, October 2001) or the most current version or updated guidance. The content of the SAP shall include the type of information described in EPA's Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA (EPA/540/G-89-004).

The QAPP will describe the quality assurance and quality control protocols necessary to achieve required data quality objectives. Respondent shall follow, as appropriate, "Quality Assurance/Quality Control Guidance for Removal Activities: Sampling QA/QC Plan and Data Validation Procedures" (OSWER Directive No. 9360.4-01, April 1, 1990), or the most current version, as guidance for QA/QC and sampling. Respondent shall only use laboratories that have a documented Quality System that complies with ANSI/ASQC E-4 1994, "Specifications and Guidelines for Quality Systems for Environmental Data Collection and Environmental Technology Programs" (American National Standard, January 5, 1995). A Quality Assurance Project Plan shall be prepared for each sample collection activity in accordance with: (1) "EPA Requirements for Quality Management Plans (QA/R5) (2001)" or the most current version; (2) for data validation "Guidance on Environmental Data Verification and Validation, EPA QA/G8 (2002)", or the most current version; and (3) the EPA Functional Guidelines for Data Review. The QAPP will address sampling procedures, sample custody, analytical procedures, and data reduction, validation, reporting, and personnel qualifications. The laboratory performing the work must have and follow an approved Quality Assurance (QA) program, which complies with "EPA Requirements for Quality Management Plans (QA/R-2)" (EPA/240/B-01-002, March 2001) or equivalent documentation as determined by EPA. If a laboratory not in the EPA Contract Laboratory Program (CLP) is selected, the QAPP shall be consistent with the requirements of the CLP for laboratories proposed outside the CLP. Respondent will provide assurances that EPA has access to laboratory personnel, equipment and records for sample collection, transportation, and analysis at reasonable times and upon reasonable notice by EPA.

All sampling and analyses performed pursuant to this Order shall conform to EPA direction, approval, and guidance regarding sampling, quality assurance/quality control (QA/QC), data validation, and chain-of-custody procedures. Respondent shall ensure that the laboratory used to perform the analyses participates in a QA/QC program that complies with the appropriate EPA guidance.

Upon request by EPA, Respondent shall have such a laboratory analyze samples submitted by EPA for quality-assurance monitoring. Respondent agrees that EPA personnel may audit any laboratory that performs analytical work under this SOW. Prior to awarding any work to an analytical laboratory, Respondent will inform the laboratory

that an audit may be performed, and that the laboratory agrees to coordinate with EPA prior to performing analyses.

Respondent shall provide to EPA the quality assurance/quality control procedures followed by all sampling teams and laboratories performing data collection and/or analysis. Upon request by EPA, Respondent shall allow EPA or its authorized representatives to take split and/or duplicate samples. Respondent shall notify EPA not less than 14 days in advance of any sample collection activity, unless shorter notice is agreed to by EPA. EPA shall have the right to take any additional samples that EPA deems necessary. EPA shall use its best efforts to notify Respondent not less than 14 days in advance of any sample collection activity EPA conducts and allow Respondent to take split or duplicate samples of any samples it takes as part of its oversight of Respondent's implementation of the Work.

All analytical data collected under this SOW shall be provided electronically to EPA.

2. Health and Safety Plan(s)

The HASP(s) ensures protection of health and safety during the performance of work under the AOC and this SOW. The HASP shall be prepared in accordance with EPA's Standard Operating Safety Guide (PUB 9285.1-03, PB 92-963414, June 1992). In addition, the plan shall comply with all currently applicable Occupational Safety and Health Administration ("OSHA") regulations found at 29 C.F.R. Part 1910. Respondent shall incorporate all changes to the plan recommended by EPA and shall implement the plan during the Removal Action.

3. Construction Quality Assurance Plan

The CQAP describes the project-specific components of the performance methods and quality assurance program to ensure that the completed project meets or exceeds all design criteria, plans, and specifications. The draft Plan shall be submitted with the Prefinal design and the Final Plan shall be submitted with the Final Design. The Final Plan shall be submitted prior to the start of construction in accordance with the approved construction schedule. The Plan shall provide requirements for the following elements:

- Responsibilities and authorities of all organization and key personnel involved in the Removal Action construction, including EPA and other agencies.

- Qualifications of the Construction Quality Assurance (CQA) Officer. Establish the minimum training and experience of the CQA Officer and supporting inspection personnel.

- Inspection and verification activities. Establish the observations and tests that will be required to monitor the construction and/or installation of the components of the Removal Action. The plan shall include the scope and frequency of each type of inspection to be conducted. Inspections shall be required to verify compliance with

environmental requirements and ensure compliance with all health and safety procedures.

- Performance standards and methods. Describe all performance standards and methods necessary to implement the removal construction. Performance monitoring requirements shall be designed to demonstrate that best management practices have been implemented during dredging operations, dredged or excavated material transportation, and cap placement.

- Sampling activities. Establish requirements for quality assurance sampling activities, including the sampling protocols, sample size, sample locations, frequency of testing, acceptance and rejection data sheets, and plans for correcting problems as addressed in the project specifications.

- Documentation. Establish the reporting requirements for construction quality assurance activities. This shall include such items as daily and weekly summary reports, inspection data sheets, problem identification and corrective measures reports, design acceptance reports, and final documentation. A description of the provisions for final storage of all records consistent with the requirements of the AOC shall be included.

IV. SUMMARY OF MAJOR DELIVERABLES/SCHEDULE

The schedule for submission to EPA of deliverables described in the SOW is presented in Table 1.

TABLE 1 – Schedule of Project Deliverables		
Engineering Evaluation/Cost Analysis (EE/CA) Work Plan	Draft EE/CA Work Plan Final EE/CA Work Plan	Within 90 days after effective date of AOC. Within 30 days after receipt of EPA comments on draft.
Upland Source Control	Upland Source Control Evaluation Report	Evaluation of upland source control will be completed in accordance with the schedule in the final EE/CA work plan.
Removal Action Area Characterization Report	Draft Removal Action Area Characterization Reports Final Removal Action Area Characterization Report	Within 150 days after EPA approval of the EE/CA Work Plan unless otherwise approved in the schedule in the Final EE/CA Work Plan if adequate justification is given and is approved by EPA. Within 30 days after receipt of EPA comments on draft Report.
Engineering Evaluation/Cost Analysis (EE/CA) Report	Technical Briefing on Proposed Remedial Alternatives First Draft EE/CA Second Draft (Public Review) EE/CA Final EE/CA	Within 30 days after approval of the Final Removal Action Area Characterization Report by EPA. Within 90 days of the Technical Briefing on Proposed Removal Alternatives. Within 60 days after receipt of EPA comments on first draft EE/CA. Within 60 days after receipt of EPA comments on second draft EE/CA.
Biological Assessment and 404 Memorandum	Draft Biological Assessment and Draft Clean Water Act Section 404 Memorandum Revised Biological Assessment and Revised	Submitted with draft EE/CA Submitted with revised draft EE/CA, within 60 days after

TABLE 1 – Schedule of Project Deliverables		
	Clean Water Act Section 404 Memorandum Draft Final BA	receipt of EPA comments on first draft EE/CA. If the ESA agencies determine that additional design information is necessary for a final BA, then a draft final BA shall be due as determined by the ESA agencies.
Project Design Documents	Conceptual (30 percent) Design Prefinal (90 percent) Design Final (100 percent) Design	Within 90 days of EPA signature of the Action Memorandum. Within 90 days after receipt of EPA comments on conceptual design. Within 60 days after receipt of EPA comments on prefinal design. The above deadlines may be modified in accordance with the schedule in the EE/CA final report if adequate justification is given and is approved by EPA.
Removal Action Work Plan	Draft Removal Action Work Plan Final Removal Action Work Plan	Within 60 days after EPA approval of the Contractor or in accordance with the schedule in the 100% design deliverable, if changes are justified in the document and approved by EPA. Within 30 days after receipt of EPA comments on draft Removal Action Work Plan.
Implementation of Removal Action	Notification of Removal Action Start Removal Action Start	Provide notification to EPA 30 days prior to initiation of Removal Action fieldwork to allow EPA to coordinate field oversight activities. 30 days after Notification

TABLE 1 – Schedule of Project Deliverables		
		Removal Action
Removal Action Completion Report	Draft Removal Action Completion Report Final Removal Action Completion Report	Within 60 days after completion of Removal Action (construction phase). Within 30 days after receipt of EPA comments on Draft Removal Action Completion Report.
Long-Term Monitoring and Reporting Plan	Draft Long-Term Monitoring and Reporting Plan Final Long-Term Monitoring and Reporting Plan Monitoring Data Reports	Within 60 days after EPA approval of the Final Design. Within 60 days after completion of the removal action and receipt of EPA comments. Schedule to be proposed by Respondent in the Long-Term Monitoring and Reporting Plan.

Reference to EPA comments reflects EPA's consideration of comments, including comments from the Oregon DEQ, the Tribes, and federal and state Natural Resource Trustees.